

plants. Although at one time of commercial importance, virus-indexing has removed viruses from stock plants and viruses are no longer commonly seen. To control, discard any plants with virus-like symptoms such as mosaic, distortion or leaf spots, and practice sanitation when propagating cuttings.

-Root knot nematodes may cause galls and swellings on the roots, with stunted plant growth and death. To control, destroy infested plants, rotate planting areas and never re-plant in known infested areas. Plant geraniums in pots of sterilized soil if the infestation is severe.

-The physiological problem oedema or dropsy occurs during the winter, when plants are over-watered indoors. Water soaked lesions develop when later become corky and rust colored. Reduce watering and increase the light levels to control this problem.

Insect Pests - For current insect control recommendations consult the county Agricultural Extension Agent, or consult the *N. C. Agricultural Chemicals Manual* on the internet at <<http://ipmwww.ncsu.edu/agchem/agchem.html>> and always follow label directions.

-Aphids frequently infest geraniums. Encourage beneficial predators such as lady bugs and syrphid flies; spray with horticultural oils such as Sunspray oil; spray with insecticidal soap such as M-Pede.

-Various caterpillars such as the cabbage looper, the fall cankerworm, leaf rollers and leaf tiers may infest geraniums. Caterpillars can be controlled with sprays of *Bacillus thuringiensis* (Dipel, Bt).

-Greenhouse whitefly is very problematic and may come into the garden on infested plants. Infested leaves turn yellow and fall; small, snowy white flies are seen on the undersides of the leaves; and a black sooty mold may be seen growing on the sugary whitefly excrement on the upper leaf surface. Control with sprays of insecticidal soap, horticultural oils or currently recommended insecticides. Never purchase plants with whitefly infestations.

-Mites can cause young leaves to appear scorched, then curl and drop off. Control with sprays of insecticidal soap, horticultural oils and currently recommended miticides.

-Subterranean termites may attack landscape or pot grown geraniums, where they tunnel through the stems and cause the plants to wilt, turn yellow and die. Clean out infested pots or planting beds, destroy any visible termite tunnels, and treat the soil with a recommended insecticide to kill the termites. Check for termite tunnels on the foundation of the house, and take care that termites do not travel from foundation plantings into the structure of the house.

-Slugs may be problematic; they can be trapped with saucers of stale beer.

Herbicide Tolerance - For current weed control recommendations consult the county Agricultural Extension Agent, and always follow label directions. Geraniums are tolerant to the herbicides bensulide (Betasan), DCPA (Dacthal), napropamide (Devrinol) and oryzalin (Surflan) when applied over the top of established plants for **pre-emergence** control of broadleaf and grassy weeds. For **post emergence** control of grassy weeds, fluazifop (Fusilade DX) and sethoxydim (Vantage) can be applied over the top of established geraniums in the landscape.